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09/728,020	12/01/2000	Richard G. Ogier	SRI/4297-2	6111

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EXAMINER	
CHOUDHURY, AZIZUL Q	
ART UNIT	**PAPER NUMBER**
2145	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/728,020	OGIER ET AL.	
	Examiner	Art Unit	
	Azizul Choudhury	2145	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 April 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 August 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Detailed Action

This office action is in response to the correspondence received on April 23, 2007.

Claim Rejections - 35 USC § 112

Claims 1 and 14 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The claims feature the language, "being received concurrently and independently on their respective path trees." However, a search of the specifications failed to teach the claimed features of, "concurrently and independently."

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gupta et al ("An Adaptive Protocol for Reliable Multicast in Mobile Multi-hop Radio Networks," (IEEE, 1999)) in view of Humblet et al (US Pat No: 5,671,357), hereafter referred to as Gupta and Humblet, respectively.

1. With regards to claim 1, Gupta teaches through Humblet a multi-hop network including a plurality of nodes that each maintains a table of network topology, a method for disseminating topology and link-state information over the multi-hop network, comprising: maintaining a path tree for each source node in the network that can produce an update message (section 2, Gupta), each path tree having that source node as a root node and further having a parent node and zero or more children nodes (equivalent to core, source and children nodes (section 3.1.1, Gupta)); receiving update messages from the parent nodes in accordance with the path trees rooted at the respective source nodes (tree rooted at core node, equivalent to claimed source node, section 3.1.1, Gupta) that originated the received update messages, the update messages including information related to links in the network and being received concurrently and independently on their respective path trees; updating the table of network topology in response to the information in the update messages received via the path trees rooted at the source nodes (tree rooted at core node, equivalent to claimed source node, section 3.1.1, Gupta); and forwarding the update messages to children nodes, if any, in accordance with the path trees rooted at the source nodes (tree rooted at core node, equivalent to claimed source node, section 3.1.1, Gupta) that originated the update messages in response to the information in the received update messages, if it is determined that the update messages should be forwarded to the zero or more children nodes, such that topology information for the network is globally updated across the plurality of nodes (Gupta teaches the using path/link presence information. A node is able to send data to its children who replied to the

acknowledgement messages since; they are the nodes that are known to be present. Plus, Gupta also teaches that a node is able to receive a message and is able to forward the message down the tree to the children nodes (section 3.5). However, Gupta does not teach the existence of tables within the nodes for the storage and updating of topology information.

In the same field of endeavor, Humblet teaches a network system where the nodes each maintain a database (tables) with topology information (column 3, lines 50-59, Humblet). In addition, the topology information within each node is updated based on events (change to the topology) (column 2, lines 23-25, Humblet). Therefore, it would have been obvious to one skilled in the art, during the time of the invention, to have combined Gupta's multi-hop network with the network taught by Humblet, to provide path computation for establishing communication between nodes (Humblet (column 1, lines 15-21, Humblet)).

2. With regards to claim 2, Gupta teaches through Humblet a method wherein the information related to the links indicates whether the update messages are to be forwarded to other nodes (Acknowledgement means are taught by Gupta (section 3.1.1, second paragraph, Gupta). However, Gupta does not teach the existence of tables within the nodes for the storage and updating of topology information.

In the same field of endeavor, Humblet teaches a network system where the nodes each maintain a database (tables) with topology information (column 3, lines 50-59, Humblet). In addition, the topology information within each node is updated based

on events (change to the topology) (column 2, lines 23-25, Humblet). Therefore, it would have been obvious to one skilled in the art, during the time of the invention, to have combined Gupta's multi-hop network with the network taught by Humblet, to provide path computation for establishing communication between nodes (Humblet (column 1, lines 15-21, Humblet)).

3. With regards to claim 3, Gupta teaches through Humblet a method wherein the path tree associated with each source node is a minimum-hop-path tree (Gupta teaches a multi-hop method (section 2, first paragraph, Gupta). However, Gupta does not teach the existence of tables within the nodes for the storage and updating of topology information.

In the same field of endeavor, Humblet teaches a network system where the nodes each maintain a database (tables) with topology information (column 3, lines 50-59, Humblet). In addition, the topology information within each node is updated based on events (change to the topology) (column 2, lines 23-25, Humblet). Therefore, it would have been obvious to one skilled in the art, during the time of the invention, to have combined Gupta's multi-hop network with the network taught by Humblet, to provide path computation for establishing communication between nodes (Humblet (column 1, lines 15-21, Humblet)).

4. With regards to claim 4, Gupta teaches through Humblet a method further comprising obtaining link-state information from one or more nodes in the path tree

rooted at a given source node for use in developing the path tree rooted at that source node (Gupta teaches acknowledgement means (section 3.1.1, second paragraph, Gupta). However, Gupta does not teach the existence of tables within the nodes for the storage and updating of topology information.

In the same field of endeavor, Humblet teaches a network system where the nodes each maintain a database (tables) with topology information (column 3, lines 50-59, Humblet). In addition, the topology information within each node is updated based on events (change to the topology) (column 2, lines 23-25, Humblet). Therefore, it would have been obvious to one skilled in the art, during the time of the invention, to have combined Gupta's multi-hop network with the network taught by Humblet, to provide path computation for establishing communication between nodes (Humblet (column 1, lines 15-21, Humblet)).

5. With regards to claim 5, Gupta teaches through Humblet a method wherein the links are wireless communication links (The network taught in Gupta's disclosure is mobile and hence wireless (section 2, first paragraph, Gupta). However, Gupta does not teach the existence of tables within the nodes for the storage and updating of topology information.

In the same field of endeavor, Humblet teaches a network system where the nodes each maintain a database (tables) with topology information (column 3, lines 50-59, Humblet). In addition, the topology information within each node is updated based on events (change to the topology) (column 2, lines 23-25, Humblet). Therefore, it

would have been obvious to one skilled in the art, during the time of the invention, to have combined Gupta's multi-hop network with the network taught by Humblet, to provide path computation for establishing communication between nodes (Humblet (column 1, lines 15-21, Humblet)).

6. With regards to claim 6, Gupta teaches through Humblet a method further comprising sending a new parent message to a node selecting that node as a new parent node for the source node originating an update message (Tree architectures allow for changes to node layouts to occur, which means that parents may become children and children may become parents. Gupta suggest within the disclosure that such means are also present (section 3.1.1, Gupta). However, Gupta does not teach the existence of tables within the nodes for the storage and updating of topology information.

In the same field of endeavor, Humblet teaches a network system where the nodes each maintain a database (tables) with topology information (column 3, lines 50-59, Humblet). In addition, the topology information within each node is updated based on events (change to the topology) (column 2, lines 23-25, Humblet). Therefore, it would have been obvious to one skilled in the art, during the time of the invention, to have combined Gupta's multi-hop network with the network taught by Humblet, to provide path computation for establishing communication between nodes (Humblet (column 1, lines 15-21, Humblet)).

7. With regards to claim 7, Gupta teaches through Humblet a method further comprising receiving from the new parent node in response to the new parent message link-state information associated with the source node that originated the update message (Gupta teaches the transferring of messages between all the nodes (sections 3.1 and 3.1.1, Gupta). In addition, the layout of the nodes is allowed to change, as stated above. However, Gupta does not teach the existence of tables within the nodes for the storage and updating of topology information.

In the same field of endeavor, Humblet teaches a network system where the nodes each maintain a database (tables) with topology information (column 3, lines 50-59, Humblet). In addition, the topology information within each node is updated based on events (change to the topology) (column 2, lines 23-25, Humblet). Therefore, it would have been obvious to one skilled in the art, during the time of the invention, to have combined Gupta's multi-hop network with the network taught by Humblet, to provide path computation for establishing communication between nodes (Humblet (column 1, lines 15-21, Humblet)).

8. With regards to claim 8, Gupta teaches through Humblet a method wherein the new parent message included a serial number and the link-state information received in response to the new parent message is associated with update messages having serial numbers that are greater than the serial number included in the new parent message (One of the major purposes of the multi-hop network is to obtain the status of the network. In addition, sequence numbers (equivalent to serial numbers) are provided

(section 3.1.1, Gupta). However, Gupta does not teach the existence of tables within the nodes for the storage and updating of topology information.

In the same field of endeavor, Humblet teaches a network system where the nodes each maintain a database (tables) with topology information (column 3, lines 50-59, Humblet). In addition, the topology information within each node is updated based on events (change to the topology) (column 2, lines 23-25, Humblet). Therefore, it would have been obvious to one skilled in the art, during the time of the invention, to have combined Gupta's multi-hop network with the network taught by Humblet, to provide path computation for establishing communication between nodes (Humblet (column 1, lines 15-21, Humblet)).

9. With regards to claim 9, Gupta teaches through Humblet a method further comprising: determining that a path through a new parent node for a source node originating an update message has the same number of node hops as a path through the current parent node, and maintaining a current parent node as the parent node for the given source node (Another incentive of the tree architecture is that messages are able to record which nodes were visited (section 2, Gupta). However, Gupta does not teach the existence of tables within the nodes for the storage and updating of topology information.

In the same field of endeavor, Humblet teaches a network system where the nodes each maintain a database (tables) with topology information (column 3, lines 50-59, Humblet). In addition, the topology information within each node is updated based

on events (change to the topology) (column 2, lines 23-25, Humblet). Therefore, it would have been obvious to one skilled in the art, during the time of the invention, to have combined Gupta's multi-hop network with the network taught by Humblet, to provide path computation for establishing communication between nodes (Humblet (column 1, lines 15-21, Humblet)).

10. With regards to claim 10, Gupta teaches through Humblet a method further comprising: determining that a path to a source node originating an update message ceases to exist; and maintaining the current parent node as the parent node for the source node (In tree network architectures, data is able to route itself by looking ahead to see if a path is available. In addition, Gupta teaches that data is able to route itself (section 2, Gupta). However, Gupta does not teach the existence of tables within the nodes for the storage and updating of topology information.

In the same field of endeavor, Humblet teaches a network system where the nodes each maintain a database (tables) with topology information (column 3, lines 50-59, Humblet). In addition, the topology information within each node is updated based on events (change to the topology) (column 2, lines 23-25, Humblet). Therefore, it would have been obvious to one skilled in the art, during the time of the invention, to have combined Gupta's multi-hop network with the network taught by Humblet, to provide path computation for establishing communication between nodes (Humblet (column 1, lines 15-21, Humblet)).

11. With regards to claim 11, Gupta teaches through Humblet a method further comprising: broadcasting the update messages to the children nodes if the number of children nodes exceeds a predefined threshold when forwarding the update messages to children nodes (Gupta teaches the monitoring and constant updating of the topology (section 2, Gupta). However, Gupta does not teach the existence of tables within the nodes for the storage and updating of topology information.

In the same field of endeavor, Humblet teaches a network system where the nodes each maintain a database (tables) with topology information (column 3, lines 50-59, Humblet). In addition, the topology information within each node is updated based on events (change to the topology) (column 2, lines 23-25, Humblet). Therefore, it would have been obvious to one skilled in the art, during the time of the invention, to have combined Gupta's multi-hop network with the network taught by Humblet, to provide path computation for establishing communication between nodes (Humblet (column 1, lines 15-21, Humblet)).

12. With regards to claim 12, Gupta teaches through Humblet a method further comprising transmitting the update messages to each child node using a unicast mode if the number of children nodes is less than a predefined threshold when forwarding the update messages to children nodes (Gupta teaches a design where messages can be transmitted by unicast as needed (section 2, Gupta). However, Gupta does not teach the existence of tables within the nodes for the storage and updating of topology information.

In the same field of endeavor, Humblet teaches a network system where the nodes each maintain a database (tables) with topology information (column 3, lines 50-59, Humblet). In addition, the topology information within each node is updated based on events (change to the topology) (column 2, lines 23-25, Humblet). Therefore, it would have been obvious to one skilled in the art, during the time of the invention, to have combined Gupta's multi-hop network with the network taught by Humblet, to provide path computation for establishing communication between nodes (Humblet (column 1, lines 15-21, Humblet)).

13. With regards to claim 13, Gupta teaches through Humblet a method further comprising: computing a parent node for each neighbor node and source node; and determining which neighbor nodes are children nodes for a given source node (For a tree network architecture to function properly, means must be present by which to detect the parent node and children nodes. Gupta teaches data structures within the nodes to identify themselves (section 3.2, Gupta). However, Gupta does not teach the existence of tables within the nodes for the storage and updating of topology information.

In the same field of endeavor, Humblet teaches a network system where the nodes each maintain a database (tables) with topology information (column 3, lines 50-59, Humblet). In addition, the topology information within each node is updated based on events (change to the topology) (column 2, lines 23-25, Humblet). Therefore, it would have been obvious to one skilled in the art, during the time of the invention, to

have combined Gupta's multi-hop network with the network taught by Humblet, to provide path computation for establishing communication between nodes (Humblet (column 1, lines 15-21, Humblet)).

14. With regards to claim 14, Gupta teaches through Humblet a network, comprising: a plurality of nodes in communication with each other over communication links, each node maintaining a path tree for each source node in the network that can produce an update message (section 2, Gupta), each path tree having that source node as a root node and further having a parent node and zero or more children nodes (equivalent to core, source and children nodes (section 3.1.1, Gupta)), wherein one of the nodes (i) receives update messages from the parent nodes in accordance with the path trees rooted at the source node (tree rooted at core node, equivalent to claimed source node, section 3.1.1, Gupta) that originated the received update messages, the update messages including information related to links in the network and being received concurrently and independently on their respective path trees, (ii) updates the table of network topology in response to the information in the update messages received via the path trees rooted at the source nodes (tree rooted at core node, equivalent to claimed source node, section 3.1.1, Gupta), (iii) and forwards the update messages to children nodes, if any, in accordance with the path trees rooted at the source nodes (tree rooted at core node, equivalent to claimed source node, section 3.1.1, Gupta) that originated the update messages in response to the information in the received update messages, if it is determined that the update message should be forwarded to the

children nodes, such that topology information for the network is globally updated across the plurality of nodes (Gupta teaches the using path/link presence information. A node is able to send data to its children who replied to the acknowledgement messages since; they are the nodes that are known to be present. Plus, Gupta also teaches that a node is able to receive a message and is able to forward the message down the tree to the children nodes (section 3.5). However, Gupta does not teach the existence of tables within the nodes for the storage and updating of topology information.

In the same field of endeavor, Humblet teaches a network system where the nodes each maintain a database (tables) with topology information (column 3, lines 50-59, Humblet). In addition, the topology information within each node is updated based on events (change to the topology) (column 2, lines 23-25, Humblet). Therefore, it would have been obvious to one skilled in the art, during the time of the invention, to have combined Gupta's multi-hop network with the network taught by Humblet, to provide path computation for establishing communication between nodes (Humblet (column 1, lines 15-21, Humblet)).

Response to Remarks

The amendment received on April 23, 2007 has been carefully examined but is not deemed fully persuasive. The following are the examiner's response to the applicant's assertions.

The first point of contention involves the claim amendment featuring the language, "via a path tree rooted at the source of the update." The applicant contends that the prior arts do not teach such a feature. The examiner disagrees. Gupta teaches in section 3.1.1 that the tree is rooted at the core node, which is equivalent to the claimed source node.

The second point of contention involves the claim language feature of: "updating the table of network topology in response to the information in the update message received via the path tree," and "such that the topology information for the network is globally updated across the plurality of nodes." The applicant insists that the Gupta and Humblet prior arts do not teach such features. The examiner disagrees with this assertion. Gupta in view of Humblet teaches the trait of "updating the table of network topology in response to the information in the update message received via the path tree." Gupta teaches how event messages (such as a new node is joining or a node is still connected) are sent throughout the nodes (section 2 and section 3.5, Gupta). The messages travel via a multi-hop technique, allowing the messages to travel through nodes through their path tree. Humblet teaches how each of the nodes is able to maintain its own event databases (tables) (column 3, lines 50-59, Humblet) so that event messages can be stored within each node. Gupta in view of Humblet also teaches the trait of "such that the topology information for the network is globally updated across the plurality of nodes." This is true because Gupta states that the multi-hop network "guarantees message delivery to all multicast nodes..." (Abstract, Gupta).

Finally the applicant contends that neither prior arts teach the newly claimed trait of "concurrent and independent." The problem with this claim feature is that it fails to be supported by the specifications. Nowhere within the eighty-six pages of specifications could the examiner find support for such a feature. Hence a 112-type rejection has been issued.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Azizul Choudhury whose telephone number is (571) 272-3909. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Cardone can be reached on (571) 272-3933. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AC

JASON CARDONE
SUPERVISORY PATENT EXAMINER